THE PERCEIVED BEHAVIORAL CONTROL OF BREASTFEEDING AMONG PREGNANT ADOLESCENTS AND ITS RELATION TO POSTPARTUM BREASTFEEDING DIFFICULTIES

Jennifer Gross, BSN

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Faculty Mentors: Karen Wambach, PhD, RN and Lauren Aaronson, PhD, RN, FAAN

University of Kansas School of Nursing

ABSTRACT

Despite a large body of evidence supporting breastfeeding as best for infants and mothers, rates still fall short of the Healthy People 2010 Goals. The initiation and duration rates of adolescents are even lower, despite the fact that benefits for this population may be greater. Breastfeeding can be explained using the theory of planned behavior and its concepts of attitude, subjective norm, perceived behavioral control, and intentions.

The purpose of this secondary analysis (N = 289) was 1) to determine the relationship between prenatal breastfeeding control (PBC), prenatal feeding intentions and breastfeeding at birth; and 2) among those who initiate breastfeeding, the relationship between PBC and breastfeeding concerns and difficulties at three and six weeks postpartum.

Data from a randomized control trial was obtained from a questionnaire measuring theory concepts upon enrollment and at 32 – 36 weeks gestation. Upon delivery, 69% of the teens (n = 201) initiated exclusive or partial breastfeeding. All breastfeeding participants were contacted by phone at 3 and 6 weeks postpartum, and completed the Breastfeeding Experiences Scale. Data analyses included descriptive statistics, Pearson or Spearman correlations, Chi-Square analysis, and narrative content and frequency analysis.

PBC perceptions were significantly related to prenatal intentions to breastfeed ($r = .54$, $p = .01$), but not significantly related to three and six week breastfeeding problem severity perceptions. Among those who breastfed at birth, mean prenatal PBC levels were higher among those who continued breastfeeding at three weeks ($t = -2.3$ (163), $p = .026$). Weaning decisions in the early postpartum period were based on physical issues, but included psychosocial issues as time progressed. In conclusion, the TPB is a useful model for predicting intentions to breastfeed in this vulnerable population.

INTRODUCTION

The decision about infant feeding is a very important one with life-long health implications for both mother and child. Substantial evidence can be found in the literature to show that exclusive breastfeeding provides numerous benefits over other methods of infant feeding. This empirical evidence has led many organizations to recommend exclusive breastfeeding for at least the first 6 months of life, if not longer. The American Academy of Pediatrics considers breastfeeding to be "the normative model against which all alternative feeding methods must be measured," (American Academy of Pediatrics [AAP], 2005, p. 496). There is a significant decrease in infectious diseases, certain cancers, asthma, and diabetes in infants who are breastfed. Mothers who breastfeed also have a decreased risk of breast and ovarian cancer, and decreased risk of hip fractures and osteoporosis later in life (AAP, 2005). The World Health Organization (WHO) also states that breastfeeding is the "ideal way of providing young infants with the nutrients they need for healthy growth and development," (WHO, 2008). The Healthy People 2010 goals set by the United States Department of Health and Human Services (USDHHS) also reflect the importance of breastfeeding to maternal and infant health. These goals include increasing breastfeeding initiation rates to 75% of all mothers, with 50% maintaining breastfeeding at 6 months, and 25% maintaining at 1 year (USDHHS, n.d.). However, the actual rates in 2001 still fell short, with only 70% of women initiating any breastfeeding at birth, 33% continuing at 6 months, and 18% breastfeeding at 1 year (AAP, 2005).

The benefits of breastfeeding are especially important to adolescent mothers. This demographic is deserving of attention, as there were 43 births per 1000 females aged 15-19 years in 2002 (Ventura, Abma, Mosher, & Henshaw, 2008). According to the Guttmacher Institute, "each year, almost 750,000 women aged 15-19 become pregnant. Overall, 75 pregnancies occur every year per 1,000 women aged 15-19," (2006). The infants of these adolescent mothers are more

likely to be hospitalized with infections, and the economic burden of formula feeding is even greater in teenagers (Koniak-Griffin & Turner-Pluta, 2001). However, despite the heightened benefits of breastfeeding in adolescents, they have lower initiation and duration rates. Only 47.6% of mothers less than 20 years old had ever breastfed, compared with 75.2% of mothers older than 30 years (Centers for Disease Control and Prevention [CDC], 2004). Having less than a high school education also negatively impacts breastfeeding initiation and duration (CDC, 2004).

As a health behavior, an adolescent's decision to breastfeed can be explained using the theory of planned behavior (Ajzen, 1991). This social psychology theory examines the determinants of behavior through three constructs that impact one's intention to perform a specific behavior. These three constructs are the attitude, subjective norm, and the perceived behavioral control toward the intended behavior.

This theory provided the framework for a recently completed randomized clinical trial (RCT) conducted at the University of Kansas School of Nursing. Dr. Karen Wambach headed this study, funded by the National Institute of Nursing Research. The overall purpose of the trial was to empirically test comprehensive education and support interventions for pregnant adolescents to promote breastfeeding. Pregnant adolescents were randomly assigned to three different study groups. In the usual care group, teenagers received no specific interventions, but were allowed to obtain existing prenatal and postpartum support. In the attention care group, adolescents received the benefits of an advanced practice nurse and a peer counselor, but education and support were aimed at healthy pregnancy and delivery information. The experimental group received lactation consultant and peer counselor support and education via classes and telephone calls that specifically promoted and supported breastfeeding.

For this research project, data from this study were used to 1) determine the relationship between prenatal breastfeeding control, prenatal feeding intentions, and breastfeeding at birth; and 2) among pregnant adolescents who initiated breastfeeding after the birth of their child, the relationship between prenatal breastfeeding control and their breastfeeding concerns and difficulties at three and six weeks postpartum.

RESEARCH QUESTIONS

1) Is prenatal perceived behavioral control (PBC) related to prenatal breastfeeding intentions?

2) Is prenatal infant feeding intention related to feeding choice at birth?

3) Is prenatal PBC related to feeding choice at birth?

4) Among those choosing breastfeeding, is prenatal PBC associated with exclusive versus partial breastfeeding at birth?

5) Is prenatal PBC related to continued breastfeeding at 3 and 6 weeks postpartum?

6) Is prenatal PBC related to breastfeeding problem severity at 3 and 6 weeks postpartum?

7) Is prenatal PBC related to individual breastfeeding problems, such as leaking, engorgement, sore nipples, fatigue, or worry about the infant receiving enough nourishment at 3 and 6 weeks postpartum?

8) Of physical and psychosocial breastfeeding difficulties at 3 and 6 weeks postpartum, which is more directly related to the decision to wean?

SIGNIFICANCE TO NURSING

That a greater sense of control over an activity relates to a higher rate of success in that activity is intuitively appealing. For example when a student studies for an exam – the more mastery the student has over the material the more likely he/she will score a better grade on the exam. This same relationship should be found between an adolescent's confidence in her breastfeeding ability and improved or increased breastfeeding in the postpartum period. The adolescent's confidence (or PBC) is just one of the three factors that contribute to her prenatal intention to breastfeed. According to a study testing the breastfeeding self-efficacy theory, higher antenatal confidence in breastfeeding ability is related to breastfeeding initiation and exclusivity, while low self-efficacy is related to alternative methods of infant feeding (Blyth, Creedy, Dennis, Moyle, Pratt, & De Vries, 2002). According to Ajzen's theory of planned behavior, the present view of perceived behavioral control is most compatible with the concept of perceived self-efficacy (1991), therefore it would be expected that PBC would relate positively to postpartum breastfeeding. "Women's predelivery intentions about breastfeeding [are] strong predictors of both initiating this behavior and continuing it through the vulnerable postdelivery period, when women may experience the most discomfort," (Ahluwalia, Morrow, & Hsia, 2005, p. 1411). This research examined these relationships between prenatal PBC and early postpartum breastfeeding patterns and concerns. Such evidence can ultimately be used to improve nursing interventions that support this at risk population. This information could be helpful to all health providers who work with adolescent mothers, so that they can use evidence-based practice to promote the best interventions.

REVIEW OF THE LITERATURE

Health Benefits of Breastfeeding

Extensive research has been done supporting breastfeeding as best for mothers and infants. The American Academy of Pediatrics reports multiple positive health outcomes from breastfeeding, from decreased rates of sudden infant death syndrome in the first year of life, to decreased incidence of leukemia and lymphoma later in life. There also seems to be enhanced neurodevelopment, with breastfed infants having higher performance on tests of cognitive development at later ages. The benefits of breastfeeding for mothers begin immediately after delivery as increased oxytocin levels from breastfeeding decrease bleeding and speed uterine involution. Benefits continue throughout the postpartum period, as breastfeeding mothers may have an earlier return to their previous weight (AAP, 2005).

Human milk has many immunological properties that confer protection to the infant in the vulnerable period of immune system development after birth. These immune benefits protect infants against various infectious diseases, including otitis media, gastrointestinal and lower respiratory illnesses (Wambach, Hetzel-Campbell, Gill, Dodgson, Abiona, & Heinig, 2005). This protection is especially important for infants of teenage mothers, as they are more often hospitalized in the first year of life for infections such as those noted above (Strobino, Ensminger, Nanda, & Kim, 1992).

Theoretical framework

The theory of planned behavior was designed to "predict and explain human behavior in specific contexts," (Ajzen, 1991, p. 181). The central factor in this theory is that of intentions, which are "indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior," (p. 181). A behavior is more likely to be performed the stronger the intention is. Ajzen identified three antecedents to intention: attitude, subjective norms, and perceived behavioral control. The attitude regarding a behavior refers to the "degree to

which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question," (p. 188). Subjective norm is the "perceived social pressure to perform or not to perform the behavior," (p. 188). The focus of this research, perceived behavioral control, refers to the "perceived ease or difficulty of performing the behavior and it is assumed to reflect past experience as well as anticipated impediments and obstacles," (p. 188). The relative importance of each antecedent varies across behaviors and situations; however PBC, in concert with intention, can directly predict behavioral achievement.

Research utilizing the theory of planned behavior

The theory of planned behavior has been successfully used in previous interventional studies for adolescents; however the results from these studies have been mixed. For instance, Van de Ven et al. performed a longitudinal test of the theory of planned behavior to predict smoking onset among adolescents with and without asthma. They found that "non-smoking asthmatic adolescents have more negative attitudes towards smoking, more PBC and lower intention to smoking," (Van de Ven, Engels, Otten, Van den Eijnden, 2007). Results also showed that PBC was the strongest predictor of intention to smoke. Interestingly, the predictive power of the theory was stronger amongst asthmatic adolescents, leading the authors to suggest that smoking initiation is more of a planned behavior in this population.

A second study looking at smoking in adolescents found similar results. Smith et al. examined the different psychosocial factors that account for teenager's smoking intentions. Their findings supported the roles of attitudes, subjective norms, and PBC as correlates of intentions regarding smoking. In regards to PBC however, the authors found that the perceived difficulty of quitting smoking if initiated was a stronger correlate than the perceived control. They also note that "some actions do not live up to attitudes or even intentions, which is one reason why people

are not as healthy as they perceive themselves to be," (Smith, Bean, Mitchell, Speizer, & Fries, 2007, p. 244). This differs from the current research study in that smoking is a negative health behavior, while breastfeeding is a positive behavior. The conclusion reached by the authors is that PBC is a valuable addition to the theory, as it strengthens the explanatory power of the TPB by taking additional factors into account.

Another study by Wise et al. examines intentions to use condoms among African-American adolescents by using the theory of planned behavior. The participants were divided by age, gender, and sexual experience. The significance of each antecedent varied amongst the different groups. For instance, condom use intention in sexually experienced females was predicted by attitudes and subjective norms, but not PBC. In sexually experienced males however, subjective norms and PBC were the strongest predictors. The one overarching predictor was subjective norm, regardless of gender and previous sexual experience. However, the questionnaire used in this study was not specifically designed to test the TPB, so the conclusions drawn cannot be widely applied (Wise, Goggin, Gerkovich, Metcalf, & Kennedy, 2006).

In a study specifically testing the TPB and breastfeeding, Wambach found that maternal attitudes are the dominant predictor of feeding intentions. PBC failed to predict duration of breastfeeding, but did explain about 23% of the variance in breastfeeding intention along with maternal attitudes. Subjective norm was not a significant predictor of intention to breastfeed (Wambach, 1997). Another study by Wambach and Koehn used focus group interviews among urban economically disadvantaged pregnant adolescents. The results of the interviews brought out themes regarding infant feeding decision-making, which were correlated with the TPB antecedents. Attitude was represented by the theme of barriers and benefits of infant feeding. The adolescents stated that breastfeeding was healthy for the baby, but was related to a loss of freedom on their

part. PBC was seen in the theme of complexity of breastfeeding versus the simplicity of bottle feeding. If one remembers that PBC is one's belief as to how difficult or easy a task will be, this theme indicates that bottle-feeding will be easier, and therefore the intention to breastfeed is decreased. Subjective norms were examined by the theme of independent choice versus social influence. Almost all of the teens stated that the infant feeding decision was theirs alone, and not influenced by the media or personal network members (Wambach & Koehn, 2004).

While there is evidence in the literature supporting the theory of planned behavior in adolescents, the outcomes of these studies vary greatly. This can be explained perhaps by remembering Ajzen's assertion that the relative importance of each antecedent varies across behaviors and situations. The behaviors of smoking, condom use, and breastfeeding are vastly different in their impact on health; therefore it is logical that the antecedents to those behaviors also would vary. There is however, an absence of research that focuses specifically on PBC and adolescents. While studies have been done examining self-efficacy and breastfeeding, this is still a slightly different concept, and research participants in those studies are not adolescents (Blyth et al., Scott et al.). Since there is an absence of research on PBC, this current study focuses on PBC, as well as the direct relationship between PBC and intentions.

RESEARCH DESIGN AND METHODS

The parent study for this research was a RCT to "test the effects of a comprehensive prenatal, in-hospital, and postpartum education and support intervention on breastfeeding initiation and duration," (Wambach, RO1 NR007773).

Participants for the study were enrolled between October 2003 and August 2006. Recruitment took place during the second trimester at various prenatal clinics and high schools in the Kansas City metropolitan area. The hospital sites included Truman Medical Center, KU Medical

Center, Saint Luke's resident clinic, Johnson County Health Department, Southwest Boulevard Family Practice clinic, KU Family medicine, and numerous Kansas City area high schools (Don Bosco Charter School, Schlagle High School, Washington High School, and Wyandotte High School).

For inclusion in the study, participants had to be between 15 and 18 years, primiparous, intending to keep their newborns, between 14 and 27 weeks of gestation, have the ability to speak and read English, and have access to a telephone for study contact. Participants were excluded from the study for multiple gestation pregnancy, premature birth, conditions warranting the newborn's admission to the neonatal intensive care unit, or significant complications during labor and delivery. Also excluded were participants with conditions for which breastfeeding is contraindicated, such as HIV.

Upon admission to the study, participants were randomly assigned to one of the three study groups: usual care, attention control, or experimental. All groups received a baseline pretest, measuring breastfeeding attitudes, subjective norms, PBC, and intentions. Those subjects in the attention control and experimental groups then attended two prenatal classes: one at the end of the second trimester and the other in the third trimester. Those in the experimental group received information from a lactation consultant/peer counselor team about making the decision regarding infant feeding and "how to" breastfeed, while those in the attention control group received general prenatal information from an Advanced Practice Registered Nurse/peer counselor team about how to have a healthy pregnancy, labor and birth. A posttest was given following the second class, comparable to the pretest. Data were collected from those in the usual care group at these same time points. Breastfeeding initiation was measured upon hospital discharge amongst all groups. The experimental group also received additional peer counselor/lactation consultant team support in the hospital. The attention-control group received peer counselor visits in the hospital. All

breastfeeding teens in the experimental and attention-control group continued to receive support for four weeks. The breastfeeding usual-care group members, like the experimental and attention-control group members, participated in data collection at 3 weeks, 6 weeks, 3 months, and 6 months postpartum, or at weaning, whichever point came first.

Prenatal data were collected using self-report questionnaires. The Breastfeeding Attrition Prediction Tool (BAPT), (Janke, 1994) was used to examine breastfeeding attitudes, subjective norms, PBC, and intentions to breastfeed. This tool is based on the theory of planned behavior, and includes 94 questions. The PBC subscale consists of ten items evaluating beliefs about the possession of necessary resources (e.g. knowledge, skills, confidence, ease of breastfeeding) using a 6-point scale with end point responses of strongly disagree and strongly agree. Items are summed for a measure of breastfeeding behavioral control (range 10-60); higher scores represent a greater sense of control over the ability to breastfeed. Two items were added to the BAPT to assess the participants' breastfeeding intention. One of the items queried subjects on the feeding method they planned to use: breast, breast and bottle (formula), or formula only. The other intention item was used for analysis in this study and used a 6-point rating scale to assess the strength of intention for each method of feeding (anchors of definitely not breastfeed [1] to definitely breastfeed [6]). The BAPT has evidence from previous studies for its reliability and validity (Janke, 1992; 1994) and was piloted with pregnant adolescents prior to the parent study. Coefficient alpha for all scales was adequate and for the PBC/BFC scale in particular at .91 (Wambach, 2001). For this study, the alpha coefficient was .89 at baseline and .90 at time two.

Feeding choice/behavior after birth was collected prior to hospital discharge and categorized as formula-feeding, breast only, and breast and formula feeding. In the postpartum period, data for the analysis were gathered using the Breastfeeding Experience Scale (BES) at three

and six weeks by telephone (Appendix B). This is a 30-item questionnaire that measures breastfeeding practices, experiences, and outcomes (weaning or continued breastfeeding). The first 18 questions use a 5-point numerical rating scale to document and rate severity of common breastfeeding events in the early postpartum period. Responses are then totaled to achieve a total breastfeeding problem severity score, with a higher score representing increased problem severity (range 18 - 90). Content validity as well as internal consistency of this scale (alpha coefficient .76) were supported during early development of the BES (Wambach, 1997), as were the internal consistency assessments (.77 - .81) in later use of the BES (Wambach, 1998; 2003). The second portion of the scale documents weaning and formula supplementation with write-in answers. For this study, the alpha coefficient was .79 at three weeks postpartum and .72 at six weeks postpartum.

DATA ANALYSIS

For this research, the baseline prenatal data were used to calculate a total PBC score and the intention score (one item). Research questions related to the PBC and breastfeeding intention relationship used data from the entire sample (n = 315); research questions dealing with feeding choice data used a smaller sample due to missing data due largely to loss to follow-up or exclusion from the study (n = 289); and data from the breastfeeding sub-sample (n = 201) (i.e. those who had initiated breastfeeding upon hospital discharge, regardless of group assignment) were used for those questions that contained post-discharge data on breastfeeding problem severity and weaning from the BES at three and six weeks. SPSS/PC Version 15 was used for data analysis. For research questions 1 through 7, Spearman and Pearson correlations, ANOVA, independent sample t-tests, or Chi square analysis were used based on level of measurement of the data. Textual and frequencies analyses were used for research question 8.

FINDINGS

There were 315 subjects in the parent study, and a sub-sample of 201 subjects was focused on for research questions four through eight, as those participants had initiated breastfeeding. Participants ranged in age from 15 to 18 years, with a mean age of 17 years. In the parent study, 60% of the participants were African-American, 21% Caucasian, and 19% other. In the secondary analysis dealing with just the breastfeeding participants, 58% were African-American, 21% were Caucasian, and 18% were "other" races. Seventy percent of subjects were currently attending school in the parent study. The majority of the subjects in the sub-sample were also currently attending school (68%), as well as single and living with their family (73%). The results are presented in conjunction with each research question:

Research Question 1

Is prenatal perceived behavioral control (PBC) related to prenatal breastfeeding intentions?

The PBC scores at baseline ranged from 10 – 60, with a mean of 39.6 (SD ± 11.67). Intentions ranged from 1 to 6, with a mean of 4.58 (SD ± 1.5). The correlation between PBC and prenatal intentions to breastfeed was positive, moderate in strength, and statistically significant ($r = .54$, $p = .01$).

Research Question 2

Is prenatal infant feeding intention related to feeding choice at birth?

The feeding choices were categorized as breastfeeding, breastfeeding and bottle-feeding (formula), or exclusively bottle-feeding. At birth, 127 participants initiated exclusive breastfeeding, 72 breastfed and bottle-fed, and 87 exclusively used formula. Chi square

analysis results indicated that those with prenatal intentions to breastfeed were more likely to do so ($\chi 2$ (10, 286) = 21.95, p = .015).

Research Question 3

Is prenatal PBC related to feeding choice at birth?

Analysis of variance was used to compare mean differences in PBC among the three feeding groups. Mean PBC levels are displayed in Table One. There were no significant differences between the three feeding groups.

Research Question 4

Among those choosing breastfeeding, is prenatal PBC associated with exclusive versus partial breastfeeding at birth?

Among those who breastfed at birth, 129 participants breastfed exclusively, and 72 chose partial breastfeeding. An independent sample t-test was used to compare the mean PBC levels among those who exclusively (mean = 39, SD±11.2) and partially breastfed (mean = 38.1, SD±11.9) at birth, and was not significantly different.

Research Question 5

Is prenatal PBC related to continued breastfeeding at 3 and 6 weeks?

At 3 weeks, 165 of those who breastfed at hospital discharge were contacted. One-hundred and thirty one subjects were breastfeeding and 34 had weaned. At 6 weeks, 120 subjects were contacted, of which 91 were breastfeeding, and 29 had weaned. Independent sample t-tests were used to test for differences in mean PBC among those who continued to breastfeed and those who had weaned. Mean PBC levels were significantly higher (t = -2.3

(163), p = .026) in subjects who continued breastfeeding (mean = 39.6, SD ± 11.9) at 3 weeks compared to those who weaned (mean = 34.4, SD ± 11.8). At 6 weeks however, the difference was no longer significant (continued breastfeeding mean = 39.3, SD± 11.7; weaned mean = 36.1, SD ± 13.7).

Research Question 6

Is prenatal PBC related to breastfeeding problem severity at 3 and 6 weeks postpartum?

At 3 weeks, the BES scores ranged from 18 – 68, with a mean of 33.04 (± 9.69). At 6 weeks, BES scores ranged from 18 – 52, with a mean of 28.87 (± 7.75), representing a significant decrease in the participant's perceptions of their problem severity over time (t = 4.1, df = 118, p < .01). Correlations between PBC and BES were not statistically significant at either 3 weeks (r = .03) or 6 weeks (r = -.12).

Research Question 7

Is prenatal PBC related to individual breastfeeding problems, such as leaking, engorgement, sore nipples, fatigue, or worry about the infant receiving enough nourishment at 3 and 6 weeks postpartum?

Individual breastfeeding problems with the greatest frequencies were identified. Correlations between PBC and these individual breastfeeding problems were not significant, ranging from -.006 to .142 at 3 weeks and r = -.019 to .028 at 6 weeks (See Table Two and Three).

Research Question 8

Of physical and psychosocial breastfeeding difficulties at 3 and 6 weeks postpartum, which is more directly related to the decision to wean?

Data were analyzed from a question on the BES in which subjects reported what led to weaning from among the first 18 items on the BES (i.e. those items that are rated in terms of severity). At 3 weeks, weaning decisions were mainly based on physical difficulties (sore nipples, difficulty latching on, and engorgement). However, at 6 weeks, the weaning decision was based on physical difficulties, process issues, and insufficient milk perceptions (difficulties latching on, worry about not having enough milk, sore nipples, the baby nursing too frequently, and worry about baby not getting enough milk).

DISCUSSION

Overall, the adolescents in this study at baseline had a high perceived behavioral control regarding breastfeeding (with a mean PBC score at baseline of 39.64 ± 11.67). This is promising because it shows that even though the participants were primparous, they had confidence in their ability to breastfeed. The results of this study do partially support the theory of planned behavior. From the first research question, prenatal breastfeeding control perceptions were significantly related to prenatal intentions to breastfeed. For research question two, it was found that those participants with a stronger intention were in fact more likely to breastfeed. However, a direct relationship was not found between PBC and breastfeeding at birth. PBC was significantly related to continued breastfeeding at 3 weeks, but was not related to breastfeeding continuation at 6 weeks. Surprisingly, PBC was not related to problem severity perceptions (total or individual items) at either 3 or 6 weeks. This may be explained by the fact that the theory of planned behavior is designed for use in predicting performance of a concrete behavior, not the experiences resulting

from that behavior. Thus, an adolescent's subjective experiences of breastfeeding experiences or problems, as measured by the BES, may not be covered under the theory.

In samples with older mothers, previous researchers (Wambach, 1997) have found support for the TPB propositions in terms of the relationship between PBC and prenatal breastfeeding intention, as well as the relationship between prenatal intention and duration of breastfeeding to four weeks postpartum. Wambach, however, found no relationship between PBC and duration of breastfeeding at four weeks postpartum. During development and testing of the BAPT, Janke (1992; 1994) found that breastfeeding control was a significant factor for duration of breastfeeding at six weeks, but not at 16 weeks postpartum. Similar results were found in her second testing of the BAPT, where PBC was significantly related to infant feeding at eight weeks. Those participants who weaned prematurely had a more negative breastfeeding sentiment, felt less control over their ability to breastfeed, and were more susceptible to negative influence from others. Janke (1994) also found that a mother's beliefs about the convenience of bottle-feeding and the importance placed on that belief was an early risk indicator of premature weaning.

Finally, in the present study, weaning decisions in the early postpartum period were based mainly on physical issues, but expanded to include process and insufficient milk concerns as time progressed. Previous research has found very similar results regarding weaning with both older mothers and adolescents. Ahluwalia et al. (2005) found that the most common reasons for early weaning were physical discomfort with the process, and uncertainty about the adequacy of milk supply. Scott, Binns, Oddy, and Graham (2006) reported that "difficulty with breastfeeding in the early postpartum period was a significant risk factor for the early cessation of breastfeeding," (p. 653). While breastfeeding difficulties were reported by the participants in this study, overall their perception of their problems was seen as mild. Wambach and Cohen (in press) list similar reasons

for weaning in the early postpartum period, specific to adolescents. They found the pain associated with breastfeeding (sore nipples, engorgement, and mastitis) was prohibitive to continued breastfeeding. Their adolescents also experienced insufficient milk perceptions, and when trying to combine this with a return to school or work found themselves unable to continue breastfeeding.

It was surprising that PBC did not relate to problem severity perception in the postpartum period. It was hypothesized that PBC would be similar to self-efficacy in this manner, since "both are concerned with perceived ability to perform a behavior," (Ajzen, 2002). When a woman has a higher sense of self-efficacy regarding breastfeeding, she will react more positively when problems arise, and persist when confronted with those problems (Blythe et al., 2002). Therefore, a higher PBC score in the prenatal period should be associated with lower problem severity perceptions in the postpartum period (i.e. a positive reaction towards breastfeeding problems). However, this relationship was not supported by the findings. Overall problem perceptions were rated as mild by this sample of teens. Perhaps there was not enough variance in problem perceptions to allow detection of a relationship between prenatal PBC and problem perceptions.

LIMITATIONS AND CONCLUSIONS

The limitations to this study include the fact that it is a secondary analysis, in which the intervention effects from the parent study were not considered. As stated earlier, the theory of planned behavior also is not designed to predict perceptions of problems associated with a behavior, but rather the performance of the behavior. Finally, only selected concepts of the theory were used for analysis, so results from this study cannot be generalized to application of the entire theory.

Several implications and recommendations for practice have been garnered by this study. Adolescents are an at-risk population regarding breastfeeding initiation and duration, and have an

increased need for support and education. Further studies should be done on other interventions to promote positive health behaviors in adolescents. The theory of planned behavior also was found to be a useful model for predicting adolescents' prenatal intentions to breastfeed. Suggestions for further research in this area include studying the relationship between self-efficacy and perceived behavioral control, and their relationship to volitional behaviors.

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Table 1. Mean Breastfeeding Perceived Behavioral Control (PBC) by Feeding Group

Feeding Category	N	Mean	Std. Deviation
1.0 Breastfeeding	129	38.96	11.21
2.0 Bottle	88	39.67	12.59
3.0 Mixed	72	38.09	11.93
Total	289	38.96	11.79

F = .35, df = 2, p = .71

Table 2. *Correlation Between BES Scores and PBC at Three Weeks Postpartum*

Breastfeeding Experience Scale Item	Range	Mean	SD	Correlation with Perceived Behavioral Control
Leaking of breast	1 - 5	3.21	1.237	-.007
Engorgement	1 - 5	2.70	1.415	-.046
Sore nipples	1 - 5	2.25	1.261	-.034
Fatigue	1 - 5	2.30	1.376	.130
Worry about infant receiving nourishment	1 - 5	2.02	1.361	-.098

Table 3. *Correlation Between BES Scores and PBC at Six Weeks Postpartum*

Breastfeeding Experience Scale Item	Range	Mean	SD	Correlation with Perceived Behavioral Control
Leaking of breast	1 - 5	2.57	1.253	-.018
Engorgement	1 - 5	1.97	1.189	-.026
Sore nipples	1 - 5	1.65	1.086	-.024
Fatigue	1 - 5	1.82	1.198	-.082
Worry about infant receiving nourishment	1 - 5	1.87	1.301	-.020

Appendix A

Breastfeeding Attrition Prediction Tool

PLEASE CIRCLE THE NUMBER THAT MOST CLOSELY DESCRIBES HOW YOU FEEL ABOUT EACH STATEMENT.

	Strongly disagree					**Strongly agree**
1. Breastfeeding is more convenient than formula feeding.	1	2	3	4	5	6
2. Breastfeeding is painful.	1	2	3	4	5	6
3. Formula feeding allows the mother more freedom.	1	2	3	4	5	6
4. Infant formula can cause allergies.	1	2	3	4	5	6
5. Breastmilk is healthy for the baby.	1	2	3	4	5	6
6. No one else can help feed the baby when you breastfeed.	1	2	3	4	5	6
7. It is difficult to breastfeed in public.	1	2	3	4	5	6
8. Formula fed babies tend to get sick.	1	2	3	4	5	6
9. Breastmilk is more nutritious than infant formula.	1	2	3	4	5	6
10. Breastfeeding makes your breasts sag.	1	2	3	4	5	6
11. Formula feeding is easier than breastfeeding.	1	2	3	4	5	6
12. Formula fed babies are more fussy than breastfed babies.	1	2	3	4	5	6
13. Breastfeeding makes you closer to your baby.	1	2	3	4	5	6

14. Breastfeeding makes returning to work hard. 1 2 3 4 5 6
15. Formula fed babies are easier to satisfy than breastfed babies. 1 2 3 4 5 6
16. Formula fed babies tend to be overweight. 1 2 3 4 5 6
17. Breastfeeding is less expensive than formula feeding. 1 2 3 4 5 6
18. When you breastfeed you never know if the baby is getting enough milk. 1 2 3 4 5 6
19. Mothers who formula feed get more rest than breastfeeding mothers. 1 2 3 4 5 6
20. Breastfeeding is natural. 1 2 3 4 5 6
21. Breastfeeding is more time consuming than formula feeding. 1 2 3 4 5 6
22. Formula feeding lets the father become close to the baby. 1 2 3 4 5 6
23. Infant formula can cause constipation. 1 2 3 4 5 6
24. Breastfeeding is best for the baby. 1 2 3 4 5 6
25. Breastfeeding is personally rewarding. 1 2 3 4 5 6
26. Breastfeeding is messy. 1 2 3 4 5 6
27. Breastfeeding ties you down. 1 2 3 4 5 6
28. Breastfeeding helps you bond with your baby. 1 2 3 4 5 6
29. Mothers who formula feed get back into shape sooner. 1 2 3 4 5 6

FOR EACH OF THE FOLLOWING PEOPLE MARK/CIRCLE HOW MUCH THEY WANT YOU TO BREASTFEED.

	Definitely NOT breastfeed						**Definitely breastfeed**	**Not Applicable**
30. The baby's father thinks I should:	1	2	3	4	5	6		0
31. My mother thinks I should:	1	2	3	4	5	6		0
32. My mother-in-law thinks I should:	1	2	3	4	5	6		0
33. My sister thinks I should:	1	2	3	4	5	6		0
34. My closest female friend thinks I should:	1	2	3	4	5	6		0
35. My doctor thinks I should:	1	2	3	4	5	6		0
36. My midwife thinks I should:	1	2	3	4	5	6		0
37. La Leche League thinks I should:	1	2	3	4	5	6		0
38. The hospital nurses think I should:	1	2	3	4	5	6		0
39. My baby's doctor thinks I should:	1	2	3	4	5	6		0
40. My childbirth class teacher thinks I should:	1	2	3	4	5	6		0
41. Other relatives think I should:	1	2	3	4	5	6		0
42. People who are important to me think I should:	1	2	3	4	5	6		0

PLEASE MARK BELOW HOW IMPORTANT EACH OF THE FOLLOWING STATEMENTS ARE TO YOU.

	NOT Important to me					**Important to me**
43. Using a feeding method that is convenient is:	1	2	3	4	5	6
44. Using a feeding method that doesn't cause me pain is:	1	2	3	4	5	6
45. Using a feeding method that lets me have some freedom is:	1	2	3	4	5	6
46. Using a feeding method that won't cause allergies is:	1	2	3	4	5	6
47. Using a feeding method that is healthy for my baby is:	1	2	3	4	5	6
48. Using a feeding method that lets someone else feed my baby is:	1	2	3	4	5	6
49. Using a feeding method that is easy to do in public is:	1	2	3	4	5	6
50. Using a feeding method that protects my baby from getting sick is:	1	2	3	4	5	6
51. Using a feeding method that is nutritious is:	1	2	3	4	5	6
52. Using a feeding method that won't make my breasts sag is:	1	2	3	4	5	6
53. Using a feeding method that is easy is:	1	2	3	4	5	6
54. Using a feeding method that keeps my baby from being fussy is:	1	2	3	4	5	6
55. Using a feeding method that lets me be close to my baby is:	1	2	3	4	5	6
56. Using a feeding method that makes it easy to return to work is:	1	2	3	4	5	6
57. Using a feeding method that satisfies my baby is:	1	2	3	4	5	6
58. Using a feeding method that keeps my baby from being overweight is:	1	2	3	4	5	6
59. Using a feeding method that is not expensive is:	1	2	3	4	5	6

60. Using a feeding method where I know the baby is getting enough is: 1 2 3 4 5 6

61. Using a feeding method that lets me get lots of rest: 1 2 3 4 5 6

62. Using a feeding method that is natural is: 1 2 3 4 5 6

63. Using a feeding method that saves time is: 1 2 3 4 5 6

64. Using a feeding method that lets the father be close to the baby is: 1 2 3 4 5 6

65. Using a feeding method that doesn't cause constipation is: 1 2 3 4 5 6

66. Using a feeding method that is best for my baby is: 1 2 3 4 5 6

67. Using a feeding method that is personally rewarding is: 1 2 3 4 5 6

68. Using a feeding method that is not messy is: 1 2 3 4 5 6

69. Using a feeding method that doesn't tie me down is: 1 2 3 4 5 6

70. Using a feeding method that helps me bond with my baby is: 1 2 3 4 5 6

71. Using a feeding method that lets me get back into shape is: 1 2 3 4 5 6

HOW MUCH DO YOU CARE ABOUT THE FOLLOWING PEOPLE'S OPINION ON HOW YOU SHOULD FEED YOUR BABY?

	Do not care at all					**Care very much**	**Not Applicable**
72. The baby's father	1	2	3	4	5	6	0

73. Your mother			1	2	3	4	5	6	0
74. Your mother-in-law			1	2	3	4	5	6	0
75. Your sister	1	2	3	4	5	6			0
76. Your closest female friend	1	2	3	4	5	6			0
77. Your doctor			1	2	3	4	5	6	0
78. Your midwife			1	2	3	4	5	6	0
79. La Leche League			1	2	3	4	5	6	0
80. Your hospital nurse			1	2	3	4	5	6	0
81. Your baby's doctor			1	2	3	4	5	6	0
82. Your childbirth educator			1	2	3	4	5	6	0
83. Other relatives			1	2	3	4	5	6	0
84. People who are important to you			1	2	3	4	5	6	0

PLEASE MARK HOW MUCH YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS.

	Strongly DISAGREE					**Strongly** AGREE
85. I have the necessary skills to breastfeed	1	2	3	4	5	6
86. I am physically able to breastfeed	1	2	3	4	5	6
87. I know how to breastfeed	1	2	3	4	5	6
88. I am emotionally ready to breastfeed	1	2	3	4	5	6
89. I am determined to breastfeed	1	2	3	4	5	6
90. I won't need help to breastfeed	1	2	3	4	5	6
91. I will have total control over my breastfeeding	1	2	3	4	5	6
92. I think Breastfeeding will be easy	1	2	3	4	5	6
93. I am confident I can breastfeed	1	2	3	4	5	6
94. I know I will have enough milk for the baby	1	2	3	4	5	6

PLEASE CIRCLE THE CORRECT ANSWER OR FILL IN THE BLANKS FOR THE FOLLOWING QUESTIONS:

95. How do you plan to feed your baby? Breast_____ Bottle_____ Both_____ Don't Know_____

96. How strongly do you feel about your feeding plans? Circle the number that most closely matches how you feel now.

I plan to:

Definitely <u>NOT</u> breastfeed **Unsure** **Definitely breastfeed**

1 2 3 4 5 6

97. How were you fed as a newborn? Breast____ Bottle____ Both____ Don't Know____

98. If you plan to breastfeed, how long do you plan to breastfeed? _____

99. If you have decided on how you will feed the baby, when did you decide?

a. Before you became pregnant

b. During the first three months of your pregnancy (1st trimester)

c. During the middle three months of your pregnancy (2nd trimester)

d. During the last three months of your pregnancy (3rd trimester)

100. If you plan to breastfeed, what was the main reason(s) you chose to breastfeed? (list as many reasons as apply)

101. If you plan to bottle-feed, what was the main reason(s) you chose to bottle-feed? (list as many reasons as apply)

102. During your pregnancy, have you been encouraged by your prenatal health care provider to breastfeed your baby? __Yes_____No_____If yes, check all that apply below.

---

a. Doctor_____

b. Nurse in prenatal clinic_____

c. Nurse Midwife_____

d. *Nurse Practitioner_____*

103. What is your age? _____

104. What is your ethnic origin?

a. Hispanic or Latino

b. Not Hispanic or Latino

104a. What race do you consider yourself of

a. American Indian or Alaska Native

b. Asian

c. Native Hawaiian or other Pacific Islander

d. Black or African American

d. White

f. Other (please specify):_____

105. Circle the highest grade completed:

Grade school: 1 2 3 4 5 6 7 8

High school: 9 10 11 12

106. Are you attending school now? (Circle all that apply)

a. Yes

b. No

c. Teen Parent Program in School

d. Home bound Study

e. Summer vacation now, return to school in fall

107. Do you plan to continue school after the baby is born? _____

108. If so, how long after your baby is born will you return to school? _____

109. Do you have a job now? _____ Yes _____ No. If yes, full-time ___ part-time___

110. Yearly family income: (whoever you consider family and is your source of income/support) (circle)

a. $10,000 or less

b. $10,001 to $25,000

c. $25,001 to $40,000

d. $40,001 to $55,000

e. $55,001 to $70,000

f. $70,001 to $85,000

g. $85,001 to $100,000

h. over $100,000

111. What is your marital status? _____

a. married

b. single, living with family

c. single, living with boyfriend (may or may not be father of baby)

d. separated

e. divorced

112. Who is YOUR main health care provider? (circle letter before choice)

a. Nurse midwife

b Pregnancy doctor (obstetrician)

c. Family practice physician

d. Nurse practitioner

d. Other (please specify)_____

113. Who will be the BABY'S main health care provider? (circle letter before choice)

a. Nurse practitioner

b. Baby doctor (Pediatrician)

c. Family practice physician

e. Other (please specify)_____

114. Have you received information and/or education from the following sources on breastfeeding? Circle all that apply

a. Hospital/clinic childbirth education class

b. Special breastfeeding class given by hospital

c. WIC education or pamphlets

d. Clinic nurse or educator

115. Are you participating in any special programs for teenage mothers? (circle all that apply)

e. Start Right

f. Healthy Start

g. Project Hope

h. Other

116. Describe the services you receive from the program. _____

117. Prior to your pregnancy did you ever use any type of birth control method?

Yes ___No___

118. If yes, what type? (circle all that apply)

a. Birth Control Pill

b. Depo-Provera – shot

c. Birth Control Patch

d. Condoms

e. Norplant

119. What were your height and weight before your pregnancy? _____

Appendix B

Breastfeeding Experience Scale

The following items describe experiences which some women have while breastfeeding. Read each item. Then circle the number on the scale to the right which best describes your experience since you started breastfeeding.

	Not at all	**Mild**	**Moderate**	**Severe**	**Unbearable**
Did you experience:					
1. Sore nipple(s):	1	2	3	4	5
2. Cracked nipple(s):	1	2	3	4	5
3. Engorgement (full, hard, tender breasts):	1	2	3	4	5
4. Baby having difficulty latching on:	1	2	3	4	5
5. Baby reluctant to nurse due to sleepiness:	1	2	3	4	5
6. Baby reluctant to	1	2	3	4	5

nurse due to fussiness:					
7. Breast infection:	1	2	3	4	5
8. Leaking breasts:	1	2	3	4	5
9. Baby nursing too frequently:	1	2	3	4	5
10. Worry about not having enough milk:	1	2	3	4	5
11. Baby having suck difficulty:	1	2	3	4	5
12. Feeling very tired/fatigued:	1	2	3	4	5

13. Worry that baby was not getting enough milk:	1	2	3	4	5
14. Difficulty positioning baby:	1	2	3	4	5
15. Worry about baby's weight gain:	1	2	3	4	5
16. Feeling tense & overwhelmed:	1	2	3	4	5
17. Feeling embarrassed when nursing:	1	2	3	4	5
18. Difficulty combining work & breastfeeding:	1	2	3	4	5
19. Other (please write in):	1	2	3	4	5

_____

The next part of the questionnaire deals with specific questions about your breastfeeding practices. Read each question and follow the directions for answering.

20. Are you still breastfeeding? Yes__ **(go to #21)** No__ **(go to #25)**

21. If you answered yes to #20, are you using any formula or nonbreast milk to feed your baby? Yes__ **(go to #22)** No__ **(you are done with this questionnaire!)**

22. If you have used non-breast milk, does it: (check one)

_____substitute a breastfeeding session

_____used as extra nourishment following breastfeeding

_____have used for both reasons

23. How often do you use non-breast milk feedings? First check if use non- breast milk **every day** or **not every day**, then below that choice choose the option that most closely matches your practice. If none of the options fit, check other and explain how often you use non-breast milk.

____every day	**____not every day**	_____other
___once	____every two days	explain_____
___twice	____every three days	

___three

___four

___five or more

____every four days

____every five days

____every six days

____once a week

24. When did you start using non-breast milk (number of days or weeks after birth?_____**(You are finished with this questionnaire, please go to next questionnaire. Thank you!)**

If you have stopped breastfeeding, please answer the following questions.

25. If you answered no to question #20, how long after you child was born did you completely stop breastfeeding? _____

26. What were the events that led to your decision to wean?_____

_____

_____

27. Were any of the events listed in items #1 - 19 directly related to your

weaning decision? Yes___ No___ If yes, which ones?_____

28. Were you using any non-breast milk or formula before you decided to wean? Yes___ **(Go to #29)** No___ **(You are finished with this questionnaire!! Thank you!)**.

29. Was the non-breast milk used to: (check one)

_____substitute a breastfeeding session

_____give extra nourishment following breastfeeding

_____used for both reasons

30. When did you start using non-breast milk feedings (number of days or weeks after birth)?_____